serially exposing said substrate to first and second reactive gases to form an adhesion layer; and

serially exposing said adhesion layer to third and fourth reactive gases to form a barrier layer adjacent to said adhesion layer.

2. The method as recited in claim 1 further including depositing a layer of copper adjacent to said barrier layer.

3. The method as recited in claim 1 further including repeating serially exposing said substrate to first and second reactive gases to form said adhesion layer to a desired thickness before serially exposing said adhesion layer to third and fourth reactive gases.

4. The method as recited in claim 3 further including repeating serially exposing said substrate to third and fourth reactive gases to form said barrier layer to a desired thickness after serially exposing said substrate to first and second reactive gases.

5. The method as recited in claim 1 further including providing first and second processing chambers wherein serially exposing said substrate to first and second reactive gases further includes serially exposing said substrate to said first and second reactive gases while said substrate is disposed in said first processing chamber and serially exposing said adhesion layer to third and fourth reactive gases further includes serially exposing said adhesion layer to third and fourth reactive gases while said substrate is positioned in said second processing chamber.

6. The method as recited in claim 3 further including providing first and second processing chambers wherein serially exposing said substrate to first and second reactive gases further includes serially exposing said substrate to said first and second reactive gases while said substrate is disposed in said first processing chamber and serially exposing said adhesion layer to third and fourth reactive gases further includes serially exposing said adhesion layer to third and fourth reactive gases while said substrate is positioned in said first processing chamber and depositing a layer of copper

adjacent to said barrier layer further includes depositing a copper layer adjacent to said barrier layer when said substrate is positioned in said second processing chamber.

7. The method as recited in claim 3 further including providing first, second and third processing chambers wherein serially exposing said substrate to first and second reactive gases further includes serially exposing said substrate to said first and second reactive gases while said substrate is disposed in said first processing chamber and serially exposing said adhesion layer to third and fourth reactive gases further includes serially exposing said adhesion layer to third and fourth reactive gases while said substrate is positioned in said first processing chamber and depositing a layer of copper adjacent to said barrier layer further includes depositing a copper layer adjacent to said barrier layer when said substrate is positioned in said third processing chamber.

8. The method as recited in claim 1 wherein serially exposing said substrate further includes introducing said second reactive gas into said processing chamber and further including purging said processing chamber of said second reactive gas before exposing said adhesion layer to said third reactive gas.

9. The method as recited in claim 1 wherein said first and third gases each includes a refractory metal compound, with the refractory metal compound associated with said first reactive gas differing from the refractory metal compound associated with said third reactive gas.

10. The method as recited in claim 1 wherein said first reactive gas is selected from the group consisting essentially of TDMAT, TDEAT and $TiCl_4$ and said second reactive gas is selected from the group consisting essentially of H_2, B_2H_6, SiH_4 and NH_3.

11. The method as recited in claim 1 wherein said third reactive gas is WF_6 and said fourth reactive gas is selected from the group consisting essentially of SiH_4, B_2H_6 and NH_3.

12. The method as recited in claim 1 wherein serially exposing said substrate further includes serially introducing said first reactive gas and said second reactive gas into said processing chamber, and purging said processing chamber of said first reactive

gas before introducing said second reactive gas by introducing a purge gas into said processing chamber after exposing said substrate to said first reactive gas and before exposing said substrate to said second reactive gas.

13. The method as recited in claim 1 wherein serially exposing said substrate further includes serially introducing said first reactive gas and said second reactive gas into said processing chamber, and purging said processing chamber of said first reactive gas before introducing said second reactive gas by pumping said processing chamber clear of said first reactive gas before introducing said second reactive gas.

14. The method as recited in claim 1 wherein serially exposing said adhesion layer further includes serially introducing said third and fourth reactive gases into said processing chamber, and purging said processing chamber of said third reactive gas before introducing said fourth reactive gas by introducing a purge gas into said processing chamber after exposing said substrate to said third reactive gas and before exposing said substrate to said fourth reactive gas.

15. The method as recited in claim 1 wherein serially exposing said adhesion layer further includes serially introducing said third and fourth reactive gases into said processing chamber, and purging said processing chamber of said third reactive gas before introducing said fourth reactive gas by pumping said processing chamber clear of said third reactive gas before introducing said fourth reactive gas.

16. A method for forming a stacked barrier layer on a substrate disposed in a processing chamber, said method comprising:

serially exposing said substrate to first and second reactive gases to form an adhesion layer, by introducing said first reactive gas into said processing chamber and removing said first reactive gas from said processing chamber before introducing said second reactive gas;

repeating serially exposing said substrate to first and second reactive gases to form said adhesion layer to a desired thickness;

serially exposing said adhesion layer to third and fourth reactive gases to form a barrier layer adjacent to said adhesion layer by introducing said third reactive gas into said processing chamber and clearing said third reactive gas from said processing chamber before introducing said fourth reactive gas;

repeating serially exposing said substrate to third and fourth reactive gases to form said barrier layer to an acceptable thickness;

purging said processing chamber of said first and second reactive gases before introducing either of said third and fourth reactive gases; and

depositing a layer of copper adjacent to said barrier layer.

17. The method as recited in claim 16 wherein said first reactive gas being selected from the group consisting essentially of TDMAT, TDEAT and $TiCl_4$, said second reactive gas being selected from the group consisting essentially of H_2, B_2H_6, SiH_4 and NH_3, said third reactive gas being WF_6, and said fourth reactive gas being selected from the group consisting essentially of SiH_4, B_2H_6 and NH_3.

18. The method as recited in claim 16 wherein serially exposing said substrate to first and second reactive gases further includes removing said first reactive gas from said processing chamber before introducing said second reactive gas by introducing an inert gas into said processing chamber, and serially exposing said adhesion layer to third and fourth reactive gases further includes clearing said third reactive gas from said processing chamber before introducing said fourth reactive gas by introducing an expulsion gas into said processing chamber, and purging said processing chamber of said first and second reactive gases further includes purging said processing chamber by introducing a purge gas into said processing chamber.

19. The method as recited in claim 16 wherein serially exposing said substrate to first and second reactive gases further includes removing said first reactive gas from said processing chamber before introducing said second reactive gas by pumping said processing chamber clear of said first reactive gas, and serially exposing said adhesion layer to third and fourth reactive gases further includes clearing said third reactive gas from said processing chamber by pumping said processing chamber clear of said third

reactive gas, and purging said processing chamber of said first and second reactive gases further includes pumping said processing chamber clear of all gases present therein.

20. A processing system for forming a stacked barrier layer on a substrate in a processing chamber, said system comprising:

means, coupled to said processing chamber, for serially exposing said substrate to first and second reactive gases to form an adhesion layer, by introducing said first reactive gas into said processing chamber and removing said first reactive gas from said processing chamber before introducing said second reactive gas;

means, coupled to said processing chamber, for repeating serially exposing said substrate to first and second reactive gases to form said adhesion layer to a desired thickness;

means, coupled to said processing chamber, for serially exposing said adhesion layer to third and fourth reactive gases to form a barrier layer adjacent to said adhesion layer by introducing said third reactive gas into said processing chamber and clearing said third reactive gas from said processing chamber before introducing said fourth reactive gas;

means, coupled to said processing chamber, for repeating serially exposing said substrate to third and fourth reactive gases to form said adhesion layer to a desired thickness before serially exposing said adhesion layer to third and fourth reactive gases;

means, coupled to said processing chamber, for purging said processing chamber of said first and second reactive gases before introducing either of said third and fourth reactive gases; and

means, coupled to said processing chamber, for depositing a layer of copper adjacent to said barrier layer.

21. A processing system for forming a stacked barrier layer on a substrate, said system comprising:

a body defining a processing chamber;

a holder disposed within said processing chamber to support said substrate;

a gas delivery system in fluid communication with said processing chamber;

a first temperature control system in thermal communication with said processing chamber;

a pressure control system in fluid communication with said processing chamber;

a controller in electrical communication with said gas delivery system, said temperature control system, and said pressure control system; and

a memory in data communication with said controller, said memory comprising a computer-readable medium having a computer-readable program embodied therein, said computer-readable program including a first set of instructions for controlling said gas delivery system to serially exposing said substrate to first and second reactive gases to form an adhesion layer on said substrate, and a second set of instructions to control said gas delivery system to serially expose said adhesion layer to third and fourth reactive gases to form a barrier layer adjacent to said adhesion layer.

22. The system as recited in claim 21 wherein said computer-readable program includes a third set of instructions to control said gas delivery system to remove said first reactive gas from said processing chamber before introducing said second reactive gas by introducing an inert gas into said processing chamber, and a fourth set of instructions to control said gas delivery system to clear said third reactive gas from said processing chamber before introducing said fourth reactive gas by introducing an expulsion gas into said processing chamber, and a fifth set of instructions to control said gas delivery system to purge said processing chamber of said first and second reactive gases before introducing said third and fourth reactive gases by introducing a purge gas into said processing chamber.

23. The system as recited in claim 21 wherein said computer-readable program includes a third set of instructions to control said pressure control system to remove said first reactive gas from said processing chamber before introducing said second reactive gas by pumping said processing chamber clear of said first reactive gas, a fourth set of instructions to control said pressure control system to and clear said third reactive gas from said processing chamber before introducing said fourth reactive gas by pumping said processing chamber clear of said third reactive gas, and a fifth set of

instructions to control said pressure control system to purge said processing chamber of said first and second reactive gases before introducing said third and fourth reactive gases by pumping said processing chamber clear of said first and second reactive gases.

24. The system as recited in claim 23 wherein serially exposing said substrate includes serially exposing said substrate to first and second reactive gases to form a titanium-containing adhesion layer, and serially exposing said adhesion layer to third and fourth reactive gases to form a tungsten-containing barrier layer adjacent to said titanium-containing adhesion layer.

25. The system as recited in claim 23 wherein said first reactive gas is selected from the group consisting essentially of TDMAT, TDEAT and $TiCl_4$, said second reactive gas is selected from the group consisting essentially of H_2, B_2H_6 and SiH_4, said third reactive gas is WF_6, and said fourth reactive gas is selected from the group consisting essentially of SiH_4, B_2H_6 and NH_3.

Please add the following new claims 26-54:

26. (New) A method for forming a metal contact on a substrate surface, comprising:

exposing the substrate surface to a first reactive gas;

exposing the substrate surface to a second reactive gas;

sequentially repeating the exposure to the first and second reactive gases until an adhesion layer having a desired thickness is formed:

exposing the substrate surface to a third reactive gas;

exposing the substrate surface to a fourth reactive gas; and then

sequentially repeating the exposure to the third and fourth reactive gases until a barrier layer having a desired thickness is formed over the adhesion layer.

27. (New) The method of claim 26, wherein the first reactive gas comprises a refractory metal-containing compound.

28. (New) The method of claim 27, wherein the refractory metal-containing compound comprises TDMAT, TDEAT, $TiCl_4$, or combinations thereof.

28. (New) The method of claim 27, wherein the second precursor gas comprises a reducing compound.

29. (New) The method of claim 28, wherein the reducing compound comprises H_2, B_2H_6, SiH_4, NH_3, or combinations thereof.

30. (New) The method of claim 27, wherein the third precursor gas comprises a refractory metal-containing compound.

31. (New) The method of claim 30, wherein the refractory metal-containing compound comprises tungsten.

32. (New) The method of claim 27, wherein the fourth comprises a reducing compound.

33. (New) The method of claim 32, wherein the reducing compound comprises SiH_4, B_2H_6, NH_3, or combinations thereof.

34. (New) The method of claim 26, further comprising depositing copper at least partially over the barrier layer.

35. (New) The method of claim 26, wherein the adhesion layer is deposited within a first processing chamber.

36. (New) The method of claim 35, wherein the barrier layer is deposited within a second processing chamber.

37. (New) The method of claim 36, wherein the copper is deposited in a third processing chamber.

38. (New) The method of claim 37, wherein the first, second and third processing chambers are each disposed about a common mainframe.

39. (New) The method of claim 35, wherein the adhesion layer and the barrier layer are both deposited in the first chamber.

40. (New) A method for depositing a barrier layer on a substrate surface, comprising:

sequentially exposing the substrate surface to a first refractory metal-containing compound and a first reducing compound; and

sequentially exposing the substrate surface to a second refractory metal-containing compound and a second reducing compound to form the barrier layer.

41. (New) The method of claim 40, wherein the first refractory metal-containing compound comprises TDMAT, TDEAT, $TiCl_4$, or combinations thereof.

42. (New) The method of claim 40, wherein the second refractory metal-containing compound comprises tungsten.

43. (New) The method of claim 40, wherein the first and second reducing compounds is selected from a group consisting of SiH_4, B_2H_6, NH_3, and combinations thereof.

44. (New) The method of claim 40, wherein the barrier layer comprises titanium, titanium nitride, tungsten, tungsten nitride, or combinations thereof.

45. (New) The method of claim 40, wherein the adhesion layer is deposited within a first processing chamber and the barrier layer is deposited within a second processing chamber.

46. (New) The method of claim 40, further comprising depositing copper at least partially over the barrier layer.

47. (New) The method of claim 46, wherein the adhesion layer is deposited within a first processing chamber and the barrier layer is deposited within a second processing chamber.

48. (New) The method of claim 47, wherein the copper is deposited in a third processing chamber and the first, second and third processing chambers are each disposed about a common mainframe.

49. (New) The method of claim 47, wherein the adhesion layer and the barrier layer are both deposited in the first chamber.

50. (New) A method for forming a metal contact on a substrate surface, comprising:

sequentially exposing the substrate surface to a titanium-containing compound and a nitrogen-containing compound to form an adhesion layer comprising titanium nitride;

sequentially exposing the substrate surface to a tungsten-containing compound and a reducing compound to form a barrier layer comprising tungsten; and

depositing copper at least partially over the barrier layer to form the metal contact.

51. (New) The method of claim 50, wherein the tungsten-containing compound comprises TDMAT, TDEAT, $TiCl_4$, or combinations thereof.